REMARKS/ARGUMENTS

This communication is in response to the Office Action of February 21, 2007. Accordingly, this response is accompanied by a request for a two-month extension of time along with the required fees.

Further, this response is accompanied with a Request for Continued Examination with the appropriate funds. An IDS is also being filed concurrently herewith.

Summary of Examiner Telephone Interview

During the Examiner telephone interview of June 19, 2007, the agent for the Applicant discussed the Office Action with the Examiner. More specifically, the agent for the Applicant discussed the nature of the invention, the nature of the cited references and the differences between the invention and the cited references. The agent for the Applicant also discussed the ability to combine the references, some of the claim rejections and the possibility of amending some of the claims.

Claim Amendments

In this response, claims 1, 13 and 33 have been amended. Claim 58 has been added.

Claim 1 has been amended to recite that the method comprises receiving a user adjustable digital loudness normalization control signal from a user during operation for controlling the configuration of said input/output characteristic having an amount of compression for loudness normalization. Claim 1 further recites that the control signal is configured to be directly increased or decreased by the user during operation for increasing or decreasing the amount of compression. Support for this claim amendment is in lines 4-13 on page 14 and in lines 4-15 on page 18 of the application

as originally filed. This is also generally described in pages 15-19 and shown in Figures 7A-9 of the application as originally filed.

Claims 13 and 33 have been amended in a similar fashion.

New claim 58 has been added which recites receiving a user adjustable digital loudness normalization control signal from a user during operation for controlling the configuration of an input/output characteristic having an amount of compression for loudness normalization. Claim 58 further recites that the control signal is configured to provide the user with a continually variable control for increasing or decreasing the amount of compression during operation. Support for claim 58 is in lines 6-22 on page 3 and in lines 4-13 on page 14 of the application in which adjusting means are described that allow the user to provide a control signal as recited in claim 58.

Claim Rejections – 35 USC § 103

In the Office Action, the Examiner rejected claims 1-40, 42, 43 and 45-57 under 35 USC 103 (a) as being unpatentable over U.S. 5,892,836 by Ishige (hereafter referred to as Ishige) in view of U.S. 6,104,822 by Melanson (hereafter referred to as Melanson).

Regarding claims 1, 13 and 33, the Examiner argued that Ishige discloses a method of generating an analog acoustic output signal from an acoustic input signal in accordance with a configurable input/output characteristic, the method comprising the steps of: (a) converting the acoustic input signal into a digital acoustic input signal; (b) transforming the digital acoustic input signal into one or more frequency domain input signals, and (c) detecting the magnitude of each of the one or more frequency domain input signals.

However, the Examiner noted that Ishige does not explicitly disclose the steps of: (d) receiving a user adjustable digital loudness normalization control signal for dynamically controlling the configuration of said input/output characteristic; (e) for each of the one or more frequency domain input signals, determining a gain value in response to the user

adjustable digital loudness normalization control signal and the magnitude of the frequency domain input signal; (f) providing one or more frequency domain output signals by multiplying each of the frequency domain input signals by the corresponding gain value; (g) transforming the one or more frequency domain output signals into a digital acoustic output signal; and (h) converting the digital acoustic output signal into the analog acoustic output signal.

However, the Examiner argued that Melanson discloses a digital signal processor hearing aid with a program selector switch that is preferably manipulable by a user to allow the user to dynamically select one of several digital signal processing means to invoke in a particular listening environment. In dealing with these environments, each of the processing means may implement such functions as compression, noise compensation, feedback cancellation etc.

The Examiner is of the opinion that applying this environmental selection switch to Ishige would allow the user to conveniently alter the characteristics of Ishige's hearing aid to further assist the user in various environments. The Examiner further argued that it would be obvious to one of the ordinary skill in the art at the time the invention was made to apply the adjustable features of Melanson to the hearing aid of Ishige.

In response, the Applicant respectfully submits that claim 1 of the subject application recites receiving a user adjustable digital loudness normalization control signal from a user during operation for controlling the configuration of an input/output characteristic having an amount of compression for loudness normalization. Claim 1 further recites that the control signal is configured to be directly increased or decreased by the user during operation for increasing or decreasing the amount of compression. Accordingly, the claimed control signal can be used by the user dynamically (i.e. at any time) to directly increase or decrease the amount of compression provided by the hearing aid regardless of the environment in which the user is located and without restricting the user to select from pre-programmed settings.

The Applicant respectfully submits that Ishige or Melanson, either alone or in combination, do not provide such a feature. Ishige and Melanson teach instruments which rely on static operation with respect to the acoustic properties of the hearing aid user. It should be noted that the Applicant does not mean permanent when the word static is used. Rather, the Applicant notes that certain characteristics of the Ishige and Melanson instruments are static in the sense that these characteristics cannot be changed dynamically by the user during normal everyday use, and can only be changed under certain conditions, such as when the instrument is connected to a fitting device as in the case of Ishige (see col. 6, lines 52-61) or when the instrument is reprogrammed by loading a different signal processing program as in the case of Melanson (see col. 19, lines 10-15).

In particular, with respect to Ishige, the hearing instrument must be connected to a "fitting device" in order for the acoustic characteristics of the instrument to be modified. There is no provision for allowing the acoustic characteristics of the instrument to be modified directly by the user in everyday use when the instrument is not connected to a fitting system. The Ishige instrument can be programmed at the time of manufacturing or afterwards during client fitting, but the instrument must be connected to a fitting device in order to be modified. It is clear that Ishige does not provide a user input that the user can dynamically adjust during everyday use to which the Examiner agrees as indicated on page 9 of the Office Action.

With respect to Melanson, the hearing instrument can be set to provide one of several acoustic characteristics, by providing the user with a program selector switch so that the user can switch between a limited number of programs during everyday use (see col. 19, lines 22-38 in Melanson). However, the user can only select between one of several predefined static responses provided by the different programs that are predefined at the time of fitting. Thereafter, the programs are fixed (i.e. static) and can only be modified when the instrument is reprogrammed. Accordingly, the user cannot make dynamic changes to the acoustic characteristics of a currently selected program

in everyday use and is restricted to selecting the predefined program that provides the best performance.

Furthermore, if the user becomes less sensitive to higher frequencies, the user cannot directly modify the amount of compression to optimize performance in those bands using Melanson's instrument based on a currently selected predefined program. Therefore, if one of the preprogrammed static processing methods in the Melanson instrument do not match the user's preference or changing hearing characteristics, the user cannot directly modify the performance of a currently selected predefined program in the Melanson instrument to address the change in their hearing characteristic or preference. With the Melanson instrument, the user is restricted to simply selecting the predefined processing method that provides the least unacceptable performance until the instrument can be reprogrammed.

It addition, it should be noted that Melanson specifically states that the plurality of predefined programs are specifically meant for operation in different listening environments, meaning different types of sound environments, such as noisy environments or quiet environments, etc. (see lines 37-46 in col. 8 of Melanson). Accordingly, it is not the intention of Melanson to provide the user with a user input that allows the user with a greater degree of freedom in fine-tuning the performance of the instrument for a given situation, environment, or changing hearing characteristic.

In contrast, the user control signal recited in claim 1 of the subject application is directed towards dynamically adjusting the amount of compression for loudness normalization and provides the user with increased flexibility in making this adjustment since the control signal can be increased or decreased by the user during operation for increasing or decreasing the amount of compression. The Applicant submits that this type of control provided by the claimed user control signal is different that than the type of user control taught by Melanson since the claimed user control signal allows the user to make an adjustment to compression along a continuum of settings. For example, the adjusting means to control the LNC signal can be a potentiometer or dial pad buttons

that provide a continuously variable loudness normalization control signal to adjust the amount of compression (see lines 4-13 on pg. 14 of the subject application).

Accordingly, the claimed user input of the subject application does not restrict the user to a few different predefined programs as is taught by Melanson. The user also does not have to connect the hearing aid to a fitting device to make changes as is taught by Ishige nor does the user have to reprogram the hearing aid as is taught by Melanson in order to get different performance.

Furthermore, with the claimed user control signal of the subject application, the user can change the amount of compression to alter the performance of the hearing aid in any way that the user sees fit and is not restricted to changing the performance of the hearing aid based on environmental conditions alone as taught by Melanson. For instance, the claimed user control signal allows the user to adjust the acoustic characteristics of the device based on the listener's subjective response to the loudness of sounds in one or more frequency bands rather than changes based on the acoustics of the listening environment and the user can make a range of adjustments along a continuum of settings. The claimed user control signal also allows the user to provide an input to compensate for changes in the user's loudness perception over time. This is not possible without reprogramming the Melanson or Ishige instruments.

Based on the above facts, the Applicant respectfully submits that the method of generating an analog acoustic output signal from an acoustic input signal in accordance with a configurable input/output characteristic, as claimed in claim 1, operates in a much different manner than the methods taught in the cited references.

With respect to claim 13 of the subject application, a plurality of user control signals are recited in which each user control signal is similar to the user control signal claimed in claim 1. In addition to the differences explained above for the claimed user control signal with respect to Melanson, the multi-control recited in claim 13, allows the user to adjust the control signals separately for each channel in a multi-channel amplification

device (see pg. 17, lines 12-18 of the subject application). The Applicant submits that such a multi-control approach is more flexible than the selector switch taught by Melanson. Whereas in Melanson the user is limited to the small number of programs preset into the instrument, the claimed multi-control allows the user to more flexibly set the compression, and hence to affect the gain, of each channel independently of the others and therefore allows a much wider range or numbers of combinations of adjustment. The Applicant submits that Melanson does not teach the use of more than one control signal that can be adjusted by the user.

With regards to claim 33, a similar argument can be made as was made for claim 1.

With regards to claim 58, this claim recites receiving a user adjustable digital loudness normalization control signal from a user during operation for controlling a configuration of an input/output characteristic having an amount of compression for loudness normalization, and that the control signal is configured to provide the user with a continually variable control for increasing or decreasing the amount of compression during operation. Based on the facts noted above, the Applicant respectfully submits that Ishige and Melanson do not teach the use of such a control signal.

Accordingly, the Applicant respectfully submits that claims 1, 13, 33 and 58 of the subject application is novel and inventive over the cited references and should be allowed. Further, since claims 2-12, 14-32, and 34-40, 42, 43, and 45-57 depend one of claims 1, 13 or 33 and introduce other patentable features, the Applicant respectfully submits that these claims should also be allowed.

CONCLUSION

In view of the foregoing comments, it is respectfully submitted that the application is now in condition for allowance. If the Examiner has any further concerns regarding the language of the claims or the applicability of the cited references, the Examiner is respectfully requested to contact the undersigned at 416-957-1603.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,
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